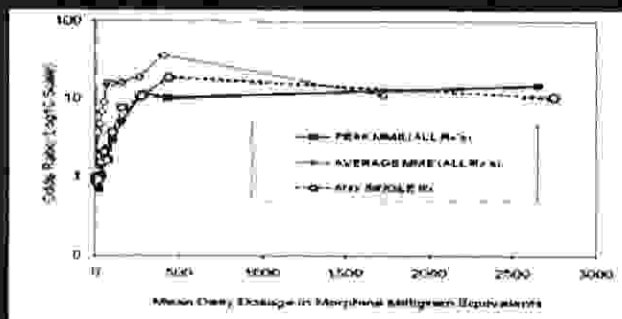
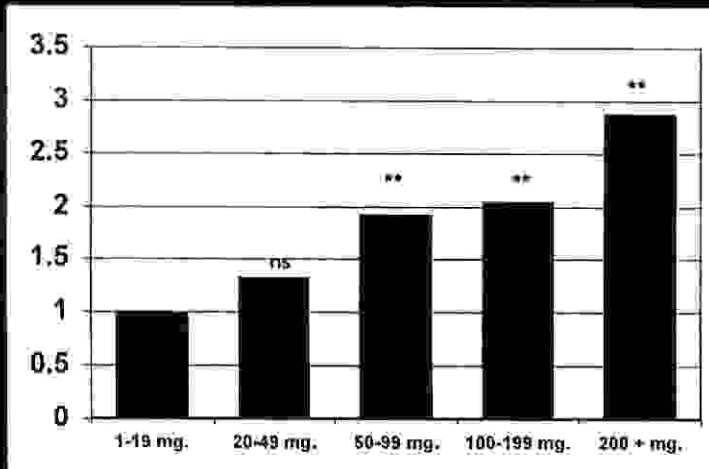


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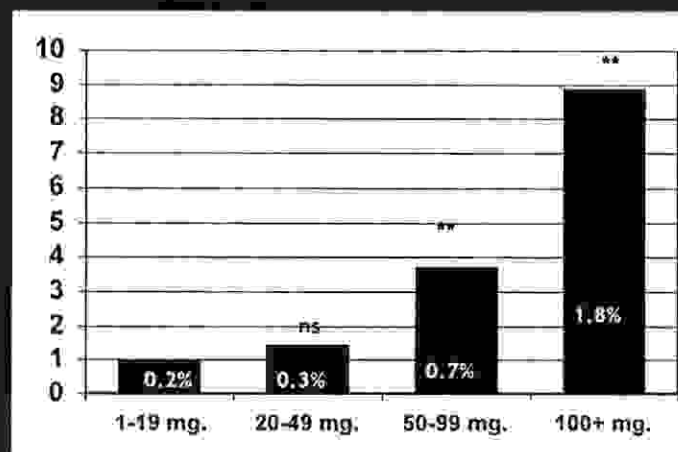


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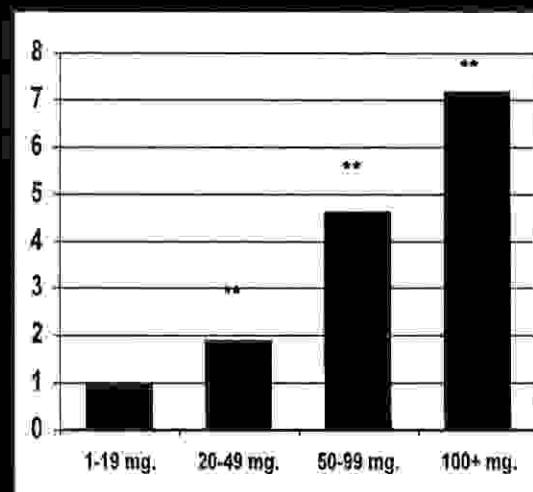


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DEATHS AND HIGH DOSES



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OPIOIDS, FUNCTION AND RETURN TO WORK

Webster et al 2007 after controlling for covariates (including injury severity), mean disability duration, mean medical costs, risks of surgery and later opioid use all increase with MED

Franklin et al 2008 after adjustment for pain, function, injury severity and other baseline covariates, > 7 days opioid and > 1 prescription is associated significantly with work disability at 1 yr

Gross et al 2009 early opioid prescription and delayed recovery are associated, but likely explained by pain severity and other confounders

Volinn et al 2009 odds of chronic work loss 11-14 times higher for pts with opioid prescriptions at <90 days
costs \$19,453 higher
strong association suggests that opioid did not arrest the cycle of work loss and pain

Webster et al Spine 2007;32:2127-32

Franklin et al Spine 2008;33:199-204

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PAIN AND FUNCTION OFTEN IMPROVE FOR PATIENTS WHO SUCCESSFULLY TAPER OFF OPIOIDS

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The New York Times

June 2, 2012

Pain Pills Add Cost and Delays to Job Injuries

By BARRY MEIER

Workplace insurers are accustomed to making billions of dollars in payments each year, with the biggest sums going to employees hurt in major accidents, like those mangled by machines or crushed in building collapses.

Now they are dealing with another big and fast-growing cost — payouts to workers with routine injuries who have been treated with strong painkillers, including many who do not return to work for months, if ever.

Workplace insurers spend an estimated \$1.4 billion annually on narcotic painkillers, or opioids. But they are also finding that the medications, if used too early in treatment, too frequently or for too long, can drive up associated disability payouts and medical expenses by delaying an employee's return to work.

Workers who received high doses of opioid painkillers to treat injuries like back strain stayed out of work three times longer than those with similar injuries who took lower doses, a 2008 study of claims by the California Workers Compensation Institute found. When medical care and disability payments are combined, the cost of a workplace injury is nine times higher when a strong narcotic like OxyContin is used than when a narcotic is not used, according to a 2010 analysis by Accident Fund Holdings, an insurer that operates in 18 states.

"What we see is an association between the greater use of opioids and delayed recovery from workplace injuries," said Alex Swedlow, the head of research at the California Workers Compensation Institute.

The use of narcotics to treat occupational injuries is part of a broader problem involving what many experts say is the excessive use of drugs like OxyContin, Percocet and Duragesic. But workplace injuries are drawing particular interest because the drugs are widely prescribed to treat common problems like back pain, even though there is little evidence that they provide long-term benefits.

Along with causing drowsiness and lethargy, high doses of opioids can lead to addiction, and they can have other serious side effects, including fatal overdoses.

Between 2001 and 2008, narcotics prescriptions as a share of all drugs used to treat workplace injuries jumped 63 percent, according to insurance industry data. Costs have also soared.

In California, for example, workplace insurers spent \$252 million on opioids in 2010, a figure that represented about 30 percent of all prescription costs; in 2002, opioids accounted for 15 percent of drug expenditures.

As a result, states are struggling to find ways to reverse the trend, and some of them have issued new pain treatment guidelines, or are expected to do so soon. These states include New York, Colorado, Texas and Washington. Insurers are also trying to influence how physicians prescribe the drugs.

Doctors in four states — Louisiana, Massachusetts, New York and Pennsylvania — appear to be the biggest prescribers of the drugs for workers' injuries, according to a review of data from 17 states by the Workers Compensation Research Institute, a group in Cambridge, Mass.

Painkiller-related costs are also hitting taxpayers, who underwrite coverage for public employees like police officers and firefighters, experts say. In February, one major underwriter, the American International Group, said that it would no longer sell backup coverage to workplace insurers, citing rising pain treatment expenses as one reason.

There is little question that strong pain medications can help some patients return to work and remain productive. But injured workers who are put on high doses of the drugs can develop chronic pain and face years of difficult treatments. It is not clear how, or if, the drugs are involved in the process, but when pain becomes chronic, the cost of a commonplace injury can equal a crippling one, experts said.

"Some of these claims look like someone who fell down an elevator shaft and had multiple injuries," said Dr. Edward J. Bernacki, the director of the division of occupational and environmental medicine at Johns Hopkins University in Baltimore.

For decades, workers' compensation plans, which vary by state, have been plagued by problems like lengthy legal battles over an injury's financial value. But it is in recent years that opioid painkillers have emerged as a major driver of costs, experts said.

Accident Fund Holdings examined its claims and found that the cost of a typical workplace injury — the sum of an employee's medical expenses and lost wage payments — was about \$13,000. But when a worker was prescribed a short-acting painkiller like Percocet, that cost

tripled to \$39,000 and tripled again to \$117,000 when a stronger longer-acting opioid like OxyContin was prescribed, said Jeffrey Austin White, an executive with the insurer, which is based in Lansing, Mich.

In a sense, insurers are experiencing the consequences of their own policies. During the last decade, they readily reimbursed doctors for prescribing painkillers while eliminating payments for treatments that did not rely on drugs, like therapy.

Those policies may "have created a monster," said Dr. Bernyce M. Peplowski, the medical director of the State Compensation Insurance Fund of California, a quasi-public agency.

For patients, such policies had consequences.

Dr. Eugenio Martinez, a physician in the Boston area who specializes in rehabilitative medicine, said one patient, a former waitress who hurt her back five years ago in a fall, recently won a court fight to force her insurer to pay for physical therapy. The insurer had cut off those payments five years ago after a few sessions, and the woman, now disabled, had no option but to take strong painkillers, Dr. Martinez said. "It certainly did not help that she was cut off," he said.

Nationwide, data suggests that a vast majority of narcotic drugs used to treat occupational injuries are prescribed by a tiny percentage of doctors who treat injured workers; in California, for example, that figure is just 3 percent. Also, the bulk of such prescriptions go to a relatively small percentage of injured workers, including those who might be addicted to the drugs or those who sell them, experts said.

Several companies, like Accident Fund Holdings and Liberty Mutual, have set up programs in which pain experts contact doctors identified as high prescribers to discuss their practices. The State Compensation Insurance Fund of California has also instituted a policy that requires approval for a doctor to prescribe an opioid for over 60 days.

Insurers say they are making progress in reducing overuse of the drugs. But their ability to influence physicians is limited because workers' compensation plans can allow employees to see any doctor. So several states have or will soon adopt new pain treatment guidelines for doctors who treat workers.

In New York, one proposal would require a doctor to refer a patient who is not improving to a pain specialist when an opioid dose exceeds a certain level, said Dr. Elain Sobol Berger, the associate medical director of the state's workers' compensation board. Washington State has already adopted such a policy.

Dr. Sobol Berger added that the New York rules, which are expected to be proposed this year, will also emphasize nondrug treatments for pain. "We know that there is a significant problem with the management of chronic pain and the use of opioids," she said.

Some insurers, like the California state fund, have also started paying for alternative approaches like specialized psychotherapy or are trying to get addicted workers into treatment. Other companies are also checking on long-disabled workers.

Mark Kulakowski, a 57-year-old former warehouse worker from Peabody, Mass., injured his back more than three decades ago while lifting a box. He has not worked since 1995. Since his injury, he has taken narcotic painkillers and has had a long list of failed treatments.

Recently, his insurer, Liberty Mutual, sought to have a nurse accompany him to his next doctor's appointment, a suggestion he welcomed if it could lead to taking fewer painkillers.

"It just drains everything out of you," he said.

Increases in the Use and Cost of Opioids to Treat Acute and Chronic Pain in Injured Workers, 1999 to 2009

Edward J. Bernacki, MD, MPH, Larry Yuspeh, BA, Robert Lavin, MD, MS, and Xuguang (Grant) Tao, MD, PhD

Objective: Quantify temporal changes in opioid use. **Methods:** Claim and prescription data for Louisiana Workers' Compensation Corporation claims open from 1999 and 2009 were analyzed by claim age and type of opioid. **Results:** There was a significant cumulative yearly increase in morphine milligram equivalents prescribed for claimants with acute pain (55-mg increase per year), as well as chronic pain (461-mg increase per year). The cost per morphine milligram equivalent was approximately the same (\$0.06 to \$0.07) for long- and short-acting medications, but the medication cost was 8 times higher in claims where long-acting opioids were prescribed (with or without short-acting opioids) versus only short-acting medications. **Conclusions:** The annual cumulative dose and cost of opioids per claim increased over the study period related to an increase in prescriptions for long-acting opioids.

The therapeutic use of opioids has increased dramatically in the United States, as evidenced by the 127% rise in retail sales of opioids between 1997 and 2007.¹ This increase in opioid use is related to the significant expansion of opioids to treat chronic non-cancer-related musculoskeletal pain.²⁻⁸ Data from the US National Ambulatory Medical Care Survey indicated that the frequency of opioid prescriptions to treat chronic musculoskeletal pain doubled from 8% of visits in 1980 to 16% of visits in 2000, whereas the use of opioids to treat acute pain increased 38% (8% to 11% of visits) over this time frame.⁴ Other studies confirm an increase in the proportion of individuals placed on opioids to treat chronic pain.^{4,5} Along with this increase was an increase in costs and a growing reliance on the part of medical providers to use stronger opioids as well as long-acting (LA) opioids in their treatment plans.^{1,7,8}

The use of opioids to treat acute and chronic pain associated with work-related conditions is related to the high prevalence of musculoskeletal injuries.⁹ A Workers Compensation Research Institute study of 16 states found that 26% of the lost-time (LT) claims had at least one opioid prescription associated with it.¹⁰ A similar proportion was observed among California workers' compensation claimants with back conditions occurring between January 2002 and November 2005.¹¹ A study in Washington state found that 42% of workers' compensation claimants suffering from LT back injuries were prescribed an opioid within a year of their injury.¹²

Using National Council on Compensation Insurance data, Lipton and colleagues⁹ found that the proportion of claimants prescribed opioids for pain for treatment within 12 months of injury increased 75% between 1999 and 2004. However, there was no increase in the proportion that used opioids to treat injuries between the 12th and 36th month among claimants.⁹ Franklin and colleagues¹³ reported that prescriptions for schedule II opioids as a percentage of all scheduled opioid prescriptions increased from 19.3% in 1996 to

37.2% in 2002. The average daily morphine-equivalent dose during this time frame increased to 132 mg (50%) per day.¹³ In contrast, Gross and colleagues¹⁴ studying Canadian workers found that opioid prescriptions within the first year of a claim decreased from 11.4% of claimants to 8.3%.

The proportionate and absolute use of opioids in the treatment of work-related injuries varies considerably from state to state.¹⁰ The average annual cumulative dose of opioids prescribed for nonsurgical claims with more than 7 days of LT was the second highest in Louisiana (equivalent to 3513 mg of morphine per claim), second only to New York, with 4040 mg per claim.¹⁰ By contrast, the annual cumulative dose of opioids per claim in most study states was between 1000 and 2000 mg of morphine equivalence or less.

The annual cumulative dose and cost of opioids used to treat non-work-related conditions for both acute and chronic pain have increased considerably, and trends in opioids prescribed to treat pain associated with occupational injuries have been studied as a new focus.^{10,14} We were interested in investigating the annual cumulative dose and cost of opioids per claim prescribed to treat work-related injuries in the state of Louisiana for both acute and chronic pain. Furthermore, we wanted to determine the use and cost of short-acting (SA) (immediate-release) and LA (methadone or controlled-release) opioid medications. To study these questions, we utilized workers' compensation claims information from the state of Louisiana paid by the Louisiana Workers' Compensation Corporation (LWCC) over an 11-year period, 1999 to 2009. LWCC is a private mutual insurance company writing workers' compensation insurance for approximately 30% of the fully insured market in the state of Louisiana. Several papers have been published by these authors utilizing the same population to study various workers' compensation cost-related topics.¹⁵⁻¹⁷

MATERIALS AND METHODS

As indicated earlier, this investigation utilized data from the LWCC. Information on all workers' compensation claims administered by the LWCC resides in the LWCC Claims Payment Database (CPD). All LWCC claims filed from 1992 to 2009 and opened between 1999 and 2009 were used as the population for this study. Information on prescription drugs was obtained from LWCC's Pharmacy Benefit Manager (PBM). A file, termed the PBM Database (PBMD), was constructed using prescription information. This information was linked to claims of all injury years that were open at some point between 1999 and 2009. The CPD information included demographic data (age, sex, etc) and injury data (date of injury, body part, *International Classification of Diseases, Ninth Revision* code, etc). In addition, the CPD file contained information on whether or not the claimant lost time from work (an LT claim) or only received medical care, but did not lose time from work (a medical only [MO] claim), as well as claim costs and the claim closing dates. The PBMD included the date of the prescription, National Drug Code for each prescription, number of prescriptions, and the number of pills per prescription between 1999 and 2009.

The selection of analysis cohort of claims and claim duration range combination are shown in Table 1. To control for the possible bias due to claim aging, we restricted the observation to only claims with a claim age of 7 years or less because 96% of LWCC claims close during the first 7 years after injury. The observed prescription

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TABLE 1. Claim Age in Years and Selection of Study Cohort*

Script Year	Accident Year																		
	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	
1992	0																		
1993	1	0																	
1994	2	1	0																
1995	3	2	1	0															
1996	4	3	2	1	0														
1997	5	4	3	2	1	0													
1998	6	5	4	3	2	1	0												
1999	7	6	5	4	3	2	1	0											
2000	8	7	6	5	4	3	2	1	0										
2001	9	8	7	6	5	4	3	2	1	0									
2002	10	9	8	7	6	5	4	3	2	1	0								
2003	11	10	9	8	7	6	5	4	3	2	1	0							
2004	12	11	10	9	8	7	6	5	4	3	2	1	0						
2005	13	12	11	10	9	8	7	6	5	4	3	2	1	0					
2006	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0				
2007	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0			
2008	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0		
2009	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	

*Study cohort was composed of any open claim with a claim age of 7 years or less during the calendar period 1999 to 2009 as shown in the bordered areas. This ensures that the case mix in claim age is comparable across the 11 prescription calendar years.

period was 1999 to 2009. Using this strategy, as shown in Table 1, we would always have a comparable mixture of claim durations (0 to 7 years) when we examined the usage over the calendar period from 1999 to 2009. The data for each prescription year is a snapshot of the claims inventory at LWCC for any open claims that are 7 years or less in duration.

We further split the claims into two groups: (1) those claims for which opioids were prescribed during the year of the accident (0 year), representing treatment for acute pain and (2) those for which opioids were prescribed during the period after the first accident year up to 7 years after the accident (1 to 7 years), representing treatment for chronic pain.

Opioids were defined as morphine-like medications that are naturally occurring, semisynthetic, or wholly synthetic substances utilized to control pain. All National Drug Codes that fit this definition were abstracted from the PBMD and were consolidated into two groups: SA (immediate release) and LA (methadone or controlled release). Because all opioids do not have the same analgesic effect, we converted the annual cumulative dose of the individual opioids into an equianalgesic dose utilizing morphine as the index. This was termed the *morphine milligram equivalent* (MME). Except as otherwise indicated, the opioid conversions were based on the Global RPh.com, an Internet opioid converter.¹⁸ The fentanyl transdermal patch conversion was based on the Duragesic package insert with the mid-dose for the 25 μ g/hour fentanyl patch of 100 mg (60 to 134 mg) morphine equivalents chosen for the conversion.¹⁹⁻²¹ Conversions for tapentadol, sublingual buprenorphine, fentanyl lozenge, propoxyphene, pentazocine, meperidine, and methadone were based on Fudin and Perkins.^{19,21} The book by Cousins and colleagues was used to determine the relative potency of tramadol.²² For the purposes of this article, the term *dose* refers to the annual cumulative dose of opioids prescribed per claim.

The MME per prescription was calculated on the basis of the following formula: $D = c \times d \times r$, where D is the MME, c is the

number of pills in the prescription, d is the dose (mg) of an opioid drug in a pill, and r is the conversion ratio of morphine for the specific opioid medication. Example 1, to calculate MME for 40 pills of acetaminophen/codeine 300/30 mg, where $c = 40$, $d = 30$ mg codeine, and $r = 0.15$ mg morphine; then MME would be: $D = 40 \times 30 \times 0.15 = 180$ mg. Example 2, to calculate the cumulative MME for 10 patches of transdermal fentanyl at 50 μ g/hour, where $c = 10$, $d = 0.05$ mg/hour, and $r = 12,000$; then MME would be: $D = 10 \times 0.05 \times 12,000 = 6000$ mg. Each patch is supposed to be changed every 3 days; therefore, 10 patches will last 30 days. This is equivalent to a person using 200 mg of morphine equivalent daily, multiplied by 30 days = 6000 mg in a month.

Analyses describe the MME per claim per calendar year by claim age (0 year, 1 to 7 years) for prescription years 1999 through 2009. A linear analysis method was used to estimate the average annual change of MME and average cost. In the model, average MME, annual cumulative dose or the annual cost per claim is the dependent variable, whereas the independent variable is the year after 1999 with 1999 as the initial year. The reason for using a linear regression instead of nonlinear regression was to obtain an annual change in the variables for the study period rather than strictly fit the trend lines that may have random fluctuations.²³ The regression and significance testing were performed using Microsoft Excel 2007 (Microsoft Corporation, Redmond, WA) data analysis tools. We then analyzed the MME and opioid medication costs per claim per calendar year by the type of opioid utilized in a claim and by claim age (0 year, 1 to 7 years). The claims defined as LA contained LA opioids with or without SA opioids, which frequently are prescribed for breakthrough or activity-related pain for patients already receiving LA opioids. However, the claims defined as SA only contained exclusively SA (immediate-release) opioids. Cost per MME was analyzed by type of opioid claims, LA or SA, for the period from 1999 to 2009. The annual change trends for the latter analysis also were simulated using linear regression.

RESULTS

The study file contained 80,159 unique claims that were open or still open at some point during the 11-year study period from 1999 to 2009. The total opioid prescriptions included for all claims with claim age at 7 years or less are 210,413; 67.7% men with a median birth year in 1964 and 32.3% women with a median birth year in 1962. Opioid prescriptions during the year of the accident represent prescriptions for acute pain, whereas opioid prescriptions after the accident year through 7 years represent prescriptions for chronic pain. Table 2 indicates that the mean claim duration for the short-duration LT and MO opioid claims was 99 and 59 days, respectively. These claim durations and, therefore, the pre-

scriptions written during this time frame fit a common definition for the treatment of acute pain (<6 months or 180 days).^{24,25} The mean claim durations for the long-duration LT and MO opioid claims were 1164 and 1028 days, respectively, which conform to the definition of treatment times for chronic pain (≥6 months or 180 days). Because the difference in claim duration varied little between LT and MO claims for both claim categories (0 year, 1 to 7 years), we merged MO and LT claims to increase the size of the study cohorts.

As seen in Figure 1, the cumulative MME per claim per calendar year significantly increased over the study period for claimants treated for acute pain (0-year claims: $P = 0.0025$) and chronic pain (1- to 7-year claims: $P = 0.0058$). The cumulative MME increased

TABLE 2. Claim Frequency and Mean Claim Duration (Days) by Prescription (Script) Year

Script Year	1-7 Yr LT			1-7 Yr MO			0 Yr LT			0 Yr MO		
	Total Claims	Opioid Claims	Opioid Claim Mean Duration (Days)	Total Claims	Opioid Claims	Opioid Claim Mean Duration (Days)	Total Claims	Opioid Claims	Opioid Claim Mean Duration (Days)	Total Claims	Opioid Claims	Opioid Claim Mean Duration (Days)
1999	5305	1727	1169	2446	104	792	2369	745	99	5864	165	65
2000	5361	1799	1284	2021	97	932	2768	731	98	6909	161	55
2001	5598	1884	1271	2476	122	879	3138	1053	102	7181	280	63
2002	6054	2306	1143	2834	164	820	3119	1138	101	5694	359	67
2003	6758	2243	1133	1843	141	959	2569	771	102	4560	182	75
2004	5035	1865	1142	1392	129	1064	2483	596	105	4241	120	56
2005	4424	1680	1128	1192	111	1184	2143	618	99	3580	159	44
2006	4027	1440	1173	977	124	1250	2091	612	92	3783	117	42
2007	3699	1232	1212	947	106	1375	1956	516	99	5027	145	71
2008	3506	989	1148	1057	79	1119	1644	461	98	4461	92	66
2009	2638	902	1003	943	82	931	1292	364	92	3942	84	45
Average	4655	1642	1164	1648	114	1028	2325	691	99	5020	169	59

LT, lost time; MO, medical only.

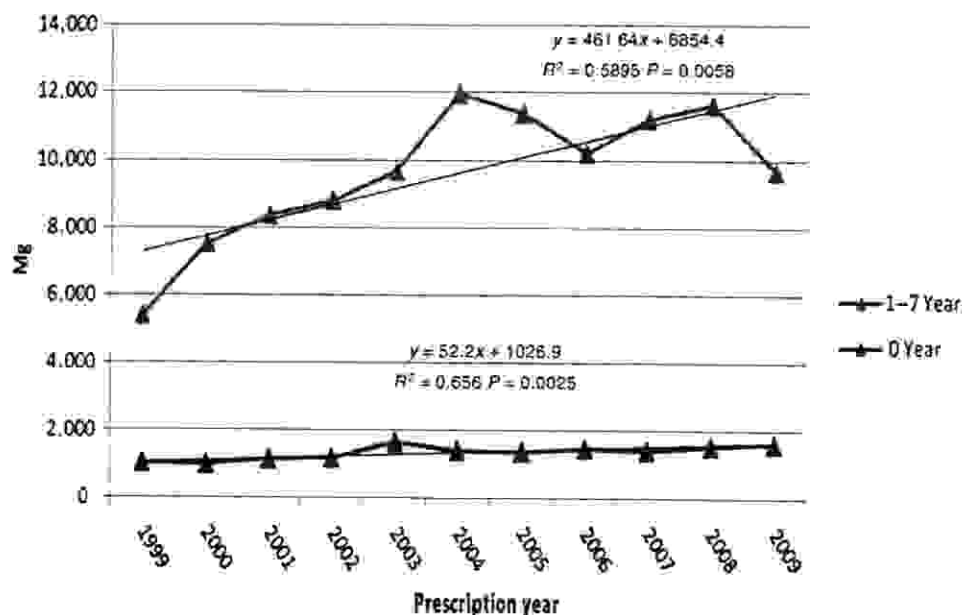


FIGURE 1. Morphine milligram equivalent dose per claim per year by claim age (0 year, 1 to 7 years), 1999 to 2009. x = year after 1999 with 1999 as year 1; y = average annual increase (milligram) per claim.

approximately 55 mg per claim per calendar year for acute pain, whereas for chronic pain it increased 461 mg per claim per calendar year. As seen in Figure 2, the cost of opioid medications per claim per calendar year increased significantly for individuals treated for chronic pain (approximately \$23 per claim per calendar year) ($P = 0.0398$) but remained relatively flat for individuals treated for acute pain (approximately \$100 per claim per calendar year throughout the study period). The cost change for acute pain was not significant ($P = 0.6783$).

Figure 3 presents changes in the annual cumulative dose of opioids prescribed per claim per calendar year for two claim categories: one group for which a LA opioid was prescribed with or

without SA opioids and another group for which only SA opioids were prescribed. The cumulative MME increased significantly for acute pain claimants (36 mg per claim per calendar year; $P = 0.0084$) and chronic pain claimants (233 mg per claim per calendar year; $P = 0.0045$) taking only SA opioids. Cumulative MMEs increased for chronic pain claimants prescribed LA opioids with or without SA opioids from 22,386 mg per claim per calendar year in 1999 to 54,396 mg per claim per calendar year in 2004, dropping down to 38,397 mg per claim per calendar year in 2009 ($P = 0.1069$). Claimants treated for acute pain with predominantly LA opioids increased approximately 431 mg per calendar year, which was not a significant increase ($P = 0.2020$). However, similar to the claimants

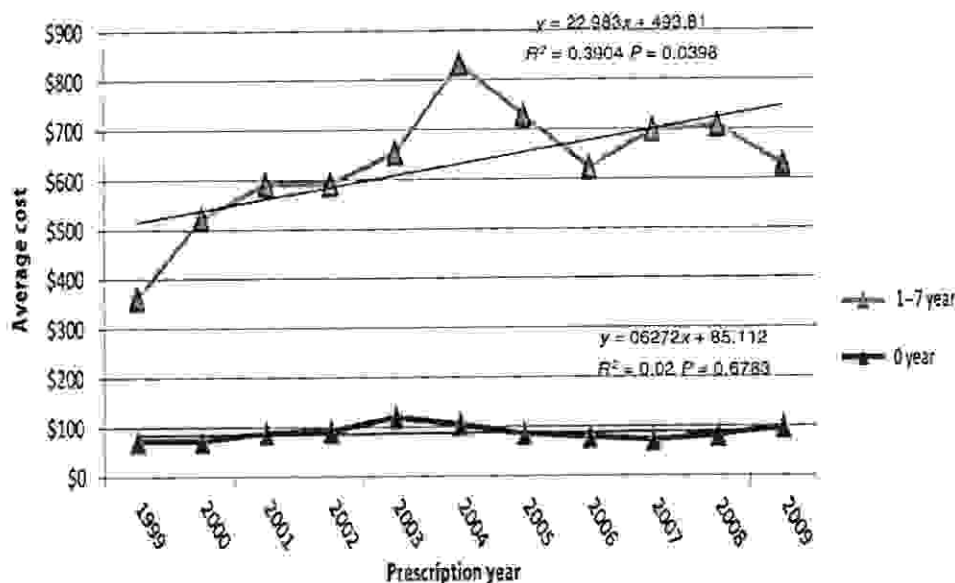


FIGURE 2. Average cost of opioid medication per claim per year by claim age (0 year, 1 to 7 years), 1999 to 2009. x = year after 1999 with 1999 as year 1; y = average annual increase in cost (\$) per claim.

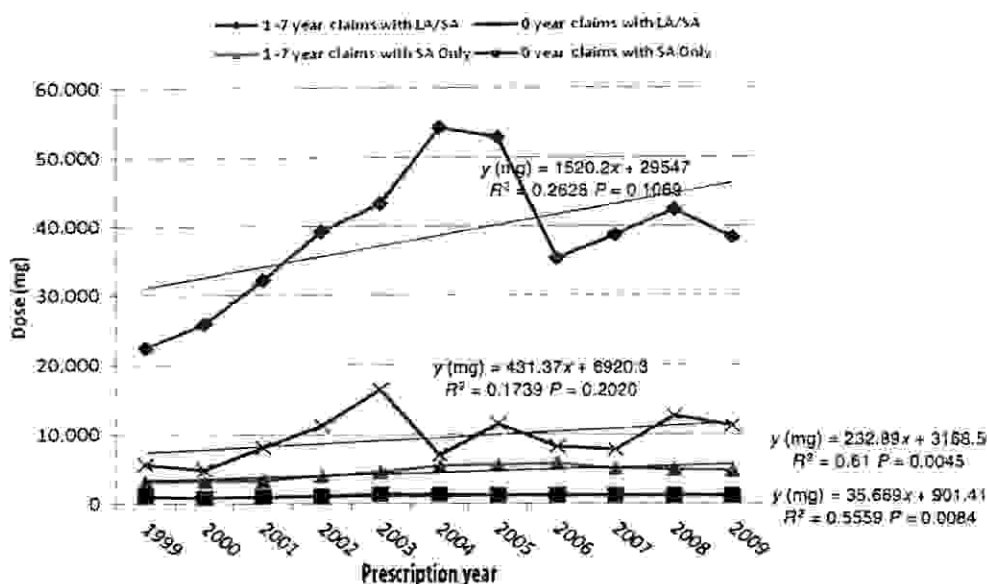


FIGURE 3. Morphine milligram equivalent dose per claim per year by type of opioid claim (long acting \pm short acting, short acting only) and claim age (0 year, 1 to 7 years), 1999 to 2009. x = year after 1999 with 1999 as year 1; y = average annual increase (milligram) per claim.

with chronic pain treated with LA opioids, the claimants treated for acute pain with LA opioids increased 190% in 2003 and then dropped 57% the following year and leveled off thereafter.

As shown in Figure 4, the monies expended on claimants with chronic pain who were prescribed predominantly LA opioids increased an average of \$112 per claim per calendar year ($P = 0.070$). The annual dose of opioids prescribed and the cost of opioids for claimants with chronic pain increased 164% during the period from 1999 to 2004 and then decreased 25% over the next 5 years. The opioid medication expenditures for claimants with acute pain treated with LA opioids increased \$17 per calendar year over the study

period. This increase was not significant ($P = 0.5026$). Nevertheless, similar to the claimants with chronic pain treated with LA opioids, claimants treated for acute pain with LA opioids increased 176% from 1999 to 2003, then dropped 132% in 2004 and leveled off thereafter ($P = 0.4210$). There were no significant increases in the costs for claimants treated with only SA opioids for acute or chronic pain over the study period ($P = 0.7395$).

Figure 5, shows that over the study period, the cost per MME decreased significantly for SA opioids, from \$0.7 per milligram to approximately \$0.6 per milligram ($P = 0.0007$), whereas the cost per MME of LA opioids remained close to \$0.6 per MME until 2009.

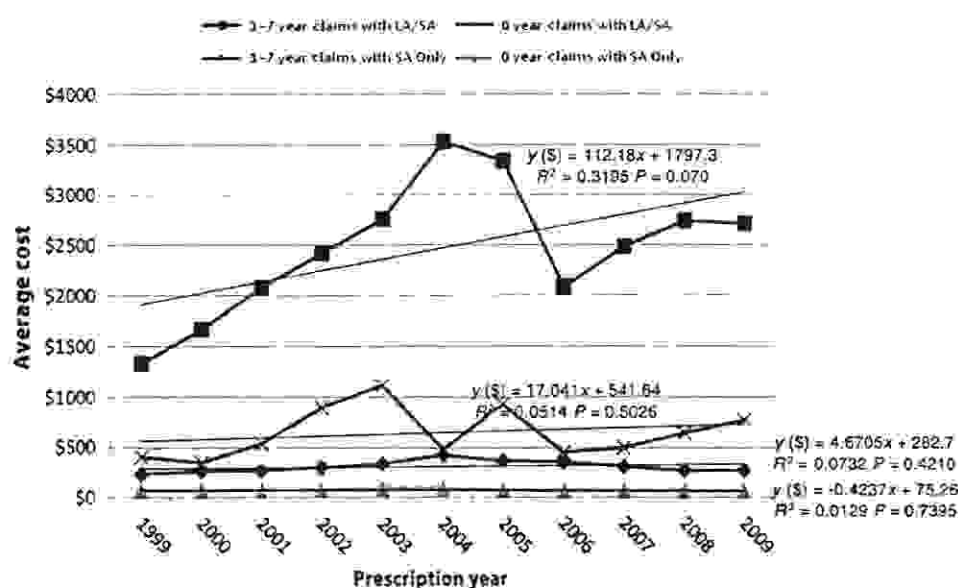


FIGURE 4. Opioid medication cost per claim per year by type of opioid claim (long acting \pm short acting, short acting only) and claim age (0 year, 1 to 7 years), 1999 to 2009. x = year after 1999 with 1999 as year 1; y = average annual increase (\$) per claim.

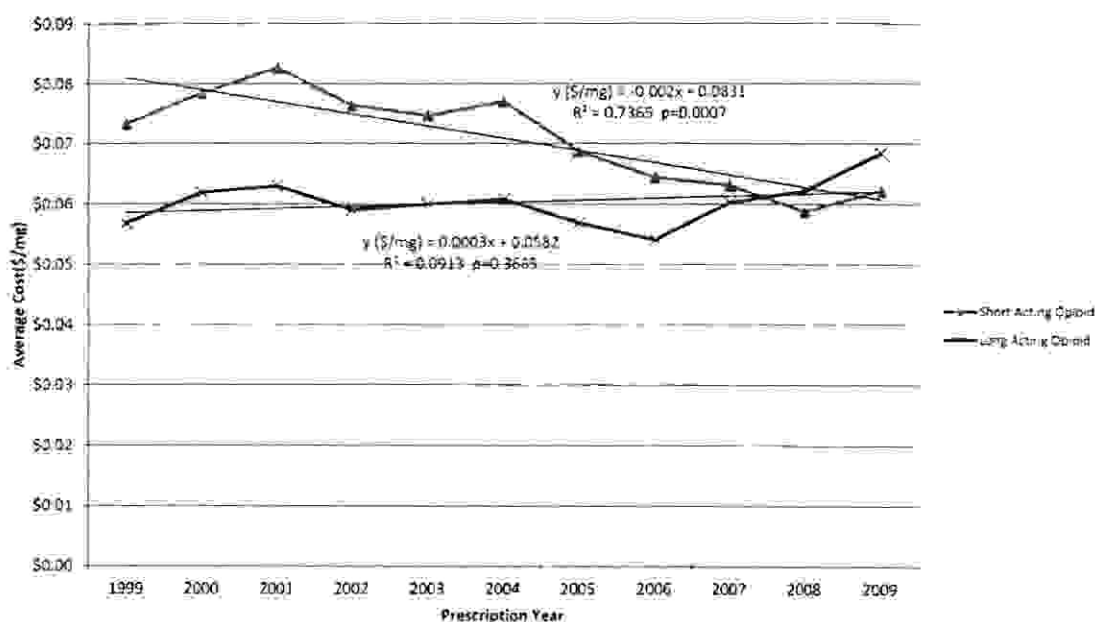


FIGURE 5. Cost (\$) per morphine milligram equivalent by type of opioid (long acting \pm short acting, short acting only), 1999 to 2009, x = year after 1999 with 1999 as year 1; y = average cost (\$) per morphine milligram equivalent.

TABLE 3. Average Opioid Costs for Claims With Long Acting \pm Short Acting and for Claims With Short Acting Only by Year

Script Year	0 Yr					1-7 Yr				
	Claims With SA Scripts Only		Claims With Any LA Scripts		Opioid Cost Ratio: Claims (SA)/Claims (LA + SA)	Claims With SA Scripts Only		Claims With Any LA Scripts		Opioid Cost Ratio: Claims (SA)/Claims (LA + SA)
	n	Average Opioid Cost (SA), \$	n	Average Opioid Cost (LA + SA), \$		n	Average Opioid Cost (SA), \$	n	Average Opioid Cost (LA + SA), \$	
1999	880	62	30	403	6.53	1617	232	214	1337	5.77
2000	856	61	36	346	5.63	1538	259	358	1666	6.44
2001	1290	76	43	537	7.11	1652	275	354	2080	7.55
2002	1474	79	23	898	11.39	2135	305	335	2421	7.93
2003	928	95	25	1114	11.78	2071	336	313	2764	8.23
2004	700	95	16	481	5.05	1732	424	262	3532	8.32
2005	764	72	13	926	12.85	1574	371	217	3339	9.00
2006	702	66	27	456	6.87	1327	362	237	2091	5.78
2007	638	61	21	505	8.25	1089	306	239	2486	8.12
2008	536	66	17	643	9.75	879	271	189	2743	10.14
2009	428	67	20	774	11.57	842	277	142	2717	9.81
Average	9196	74	271	610	8.25	1496	315	260	2426	7.71

LA, long acting; SA, short acting

when it increased to a little less than \$0.7 per MME in the last year of the study. The trend was not significant ($P = 0.3665$).

The average annual opioid cost for claims involving an LA opioid to treat both acute and chronic pain was approximately 8 times higher than claims involving only SA opioids (Table 3). Thus, although the cost of opioids per MME varied little between LA and SA opioids, the opioid cost per claim per calendar year of claims involving LA opioids was much greater than claims where only SA opioids were used. Although the data are not presented, approximately 85% of claims involving LA opioids to treat both acute and chronic pain also had SA opioids prescribed. Hydrocodone accounted for 60% of the dosage (in MMEs) of SA opioids, followed by oxycodone (16%) and propoxyphene (16%). Sustained-release oxycodone accounted for approximately 51% of the dosage of LA opioids followed by transdermal fentanyl (33%) and methadone (10%).

DISCUSSION

Chronic pain commonly is defined as pain that lasts longer than 3 to 6 months and/or pain that persists beyond the normal time for tissue healing.^{24,25} The mean claim duration for claims involving opioids in the year of the injury for both MO and LT claims was less than 3 to 6 months (MO, 59 days; LT, 99 days). For claims that were open past the year of injury to 7 years, the average claim duration was 1164 days for 1 to 7 years LT and 1028 for 1 to 7 years MO. Therefore, we feel that studying prescription use of short-duration claims approximates prescription use for acute pain, and prescription practices for long-duration claims, chronic pain. A somewhat similar strategy, but of differing time periods, has been used by other authors studying opioid-prescribing practices in workers' compensation.^{11,26,27}

Our study indicated that the annual cumulative dose of opioids prescribed for both acute and chronic pain associated with workplace injuries in the state of Louisiana increased significantly. In each of the study years, the annual cumulative dose of opioids prescribed to treat chronic pain was approximately four to seven times greater than the annual cumulative dose used to treat acute pain. This was related to increasing doses of opioids prescribed for claims defined as LA opioid claims (with or without SA opioids) in the treatment of

chronic pain. In our investigation, we found that controlled-release oxycodone and transdermal fentanyl accounted for 84% of cumulative MMEs involving LA opioids. These findings are consistent with other studies from a comparable time period that report greater increases in opioids utilized in LA preparations than used in SA or immediate-release opioid medications.^{1,7,8} It also may be reflective of the growing perception among Louisiana physicians that LA opioids have advantages, such as consistent dosing schedules and sustained analgesia, over immediate-release preparations. What we found interesting was that the cost per MME for both LA and SA opioids was approximately the same (\$0.6 to \$0.7). Nevertheless, the expense for claims utilizing LA medications was eight times higher for individuals treated for chronic pain than claims involving only SA medications in treating what we defined as chronic pain. This suggests that once a decision has been made to utilize LA medications, the annual cumulative dose of opioids prescribed increases dramatically. It was noted that hydrocodone accounted for the majority of SA opioids prescribed, probably due to ease of prescription because it is a schedule III opioid.

Systemic reviews of opioid use for chronic back pain and chronic noncancer pain provides little or no evidence of the effectiveness of utilizing opioids on a long-term basis to reduce pain and improve functional status.^{1,2-8} The increases in the annual cumulative dose of opioids used and the reliance on LA opioids to treat chronic pain takes place despite the evidence that their use does not decrease pain nor increase function for injured workers. In fact, in workers' compensation claimants prescribed opioids, there is an increased risk of delayed return to work.^{11,28}

There were 1642 claimants who lost time and were treated for chronic pain and 691 claimants who lost time and were treated for acute pain in our study. Louisiana is one of the few US states that uses the wage-loss method in calculating indemnity benefits. Temporary/total benefits are paid until the injured employee returns to work, at which time the claim is closed, except for the few claimants who are paid supplemental benefits after they returned to work (if they return to a lesser-paying job).²⁸ Therefore, an LT claimant in our study remained out of work for the entire duration of the claim. This differs from studies performed in non-wage-loss states where a

claim is classified as an LT claim if the individual loses enough time from work to meet the definition of eligibility for temporary/total benefits. This difference in the way temporary/total is calculated in Louisiana versus the majority of other states may partially explain the relatively high annual cumulative dose of opioid use in the state of Louisiana versus other states.¹⁰ It may also explain some of the differences in temporal trends between our study and studies by others in non-wage-loss states.^{9,13}

In December 2004, the LWCC adopted a preferred drug list (PDL) to guide health care providers to use efficacious and cost-effective opioids and other medications for their patients.²⁹ The PDL listed 3 tiers of medication. Tier 1 represented medications deemed to be first-line medications that did not require prior authorization. Tiers 2 and 3 required the prescriber to complete a prior authorization form before the medication could be dispensed. Tier 1 opioids included codeine, hydrocodone, morphine, oxycodone, propoxyphene, tramadol, and hydromorphone. The imposition of the PDL seems to have had an effect on the dose and types of opioids prescribed, as well as the cost. The PDL undoubtedly constrained LA opioid use as evidenced by a sharp reduction in cumulative MMEs of LA opioids between 2004 and 2006. Morden and colleagues³⁰ also observed a significant decrease in controlled-release oxycodone use after the imposition of prior authorization in a Medicaid population. We performed a Joinpoint analysis (SEER Surveillance Epidemiology and End Point, National Cancer Institute, Bethesda, MD) on the opioid costs of 1- to 7-year claims and found that the slope was +72 between 1999 and 2004 and was -26 from 2004 to 2009.³¹ This lends support to the notion that the PDL did alter the rate of growth of medications and their cost in the treatment of chronic pain and perhaps acute pain. After the PDL was adopted, there was a significant decrease in the amount paid per MME for SA opioids, presumably because more generic medications were used after its adoption. Tier 1 medications did not include any brand-name formulations, which would have the effect of decreasing the unit cost of the SA opioids.

In our study, we found that the annual cumulative dose of opioids to treat acute pain averaged around 14 MMEs, whereas the use of LA opioids to treat chronic pain averaged approximately 110 MMEs. It seems that special vigilance should be directed at these individuals because the potential for overdose is significant among individuals at these high dosage levels, with an 8.9 odds ratio of overdose for individuals prescribed 100 mg opioids or more daily.^{10,13,32}

There are a number of limitations in this study. We could study only the annual cumulative dose of medication prescribed per claim rather than the actual daily dosage used by the claimant. It is conceivable that all of the medication that was prescribed may not have been used by the claimants and the dose prescribed not representative of the dose used. Our definition of acute and chronic pain may be challenged. However, we attempted to utilize the common time frames that are employed to define acute and chronic pain. We feel that this approach is justified in performing an epidemiologic study of the type we engaged in here. As indicated, Louisiana is a wage-loss state and, because of this, the magnitude of our findings may differ from non-wage-loss states.

Our study indicates the dose of opioid medication prescribed for chronic and acute pain increased significantly over the study period. However, the primary driver of these increases was related to LA opioids prescribed for chronic pain. Corresponding cost increases were associated with the increase in volume, as the price per MME remained rather constant throughout the study period. What we observed in Louisiana seems to correspond to the increase in opioid use to treat chronic pain in North America.^{12,32,33} This investigation leads to a number of questions about the use of opioids in workers' compensation. How does the use of opioids change over the duration of a claim? Does the early use of LA opioids influence

claim duration? How do opioid prescriptions affect overall claim cost and duration of disability? Does a physician's specialty affect the dose and type of opioids prescribed? We plan to study these and other questions utilizing the same data set we utilized in this study.

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Estimated Savings from Enhanced Opioid Management Controls through 3rd Party Payer Access to the Controlled Substance Utilization Review and Evaluation System (CURES)

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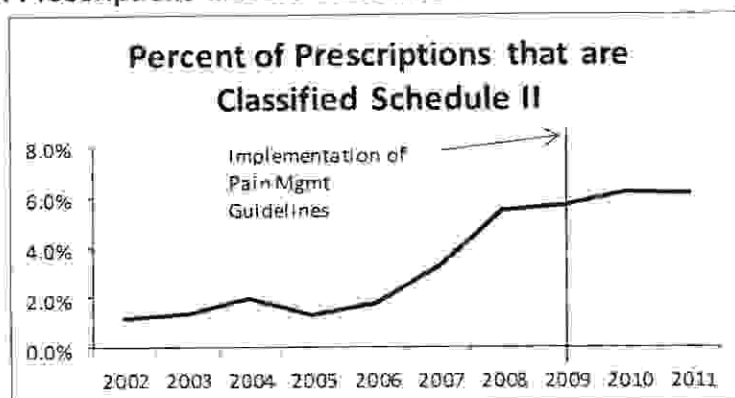
January 2013

Background

Excessive opioid utilization has become a national public health issue as well as a known cost driver in the California Workers' Compensation System. Studies have documented the increase in opioid prescriptions and the association of graduated opioid use and adverse outcomes, including delayed recovery for injured workers, added claims costs, and high rates of litigation.¹

In 2009, in an effort to establish controls on opioid utilization, the Division of Workers' Compensation implemented a chronic pain management guideline within the Medical Treatment Utilization Schedule. However, recent research that measured the use of Schedule II opioids in California workers' compensation through June of 2011 found that utilization of these narcotic painkillers continued to increase following the implementation of the pain management guideline.² Though the study also included preliminary data from the 3rd and 4th quarters of 2011 that indicated a recent reduction in the use of Schedule II opioids, utilization still remained significantly higher than evidence-based guideline recommendations (Exhibit 1).

Exhibit 1. Percent of Prescriptions that are Classified Schedule II



In contrast, the Texas Department of Insurance, Division of Workers' Compensation recently adopted a closed formulary pharmacy rules in an attempt to better control pharmaceutical utilization and their associated cost. In a preliminary report on the impact of the closed formulary that was effective on claims

¹ Swedlow, A., Gardner, L., Ireland, J., Genovese, E. Pain Management and the Use of Opioids in the Treatment of Back Conditions in the California Workers' Compensation System. Report to the Industry. CWCI. June 2008

² Swedlow, A., Ireland, J., Gardner, L. Analysis of Medical and Indemnity Benefit Payments, Medical Treatment and Pharmaceutical Cost Trends in the California Workers' Compensation System. CWCI June 2012

after August 2011, Texas reported not only a marked decrease in the use of brand drugs but also a nine percent drop in the use of opioids and a 57 percent reduction in opioids requiring preauthorization.⁹

Among the factors contributing to the rapid escalation in the use of Schedule II opioids in the California workers' compensation system are the structural limitations of the medical cost controls. Unlike federal programs and most group health plans, the California workers' compensation system has fewer supply-and-demand-side controls to manage the utilization and cost of pharmaceuticals. The lack of such control mechanisms as co-payments, deductibles, closed formularies and limited generic substitution restrict third-party payers' ability to adequately manage pharmaceutical costs. In addition, because workers' compensation accounts for less than 5% of the total California healthcare economy, monitoring potential abuses by patients and physicians across other payment systems is limited.

Some California workers' compensation stakeholders have suggested that enabling third-party payer access to the Controlled Substance Utilization Review and Evaluation System (CURES) would improve quality of care, utilization and cost controls and assist employer and payer efforts to more effectively address prescription drug fraud and abuse. The CURES system currently lacks an operational budget and seeks funding before July 2013, when the system will be taken off-line. In an effort to provide an analysis on the value of appropriate funding of CURES as a viable tool for controlling the utilization and cost of opioids, the authors have compiled data and constructed a model to estimate the:

- current volume of California workers' compensation claims in which opioids are prescribed;
- level of opioid use for claims with prescriptions opioids; and
- estimated savings that could be generated by integrating 3rd party payer access to the CURES database with other medical cost containment strategies.

Estimating Claims with Opioid Utilization

Exhibit 2 shows the estimated number of California work injury claims from accident year 2011 in which opioids were prescribed and the distribution of claims based on the number of Schedule II and Schedule III opioid prescriptions filled within the first 24 months of injury.

Exhibit 2. Estimated Number of AY 2011 California WC Claims with Opioid Prescriptions and Distribution by Number of Opioid Prescriptions Dispensed at 24 Months Post-Injury

Total Claim Count (AY 2011)	500,000	
Percentage of Claims with Opioids	23.1%	
Total Opioid Claims	115,447	
# of Opioid Prescriptions @ 24 Months	% of Claims	Estimated Number of AY 2011 Claims w/ Opioids
1 prescription	41.1%	47,434
2-3 prescriptions	24.7%	28,508
4-7 prescriptions	13.6%	15,745
>7 prescriptions	20.6%	23,760
Total Opioid Claims	100.0%	115,447

⁹ Impact of the Texas Pharmacy Closed Formulary, A Preliminary Report, 2012, Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, October, 2012

There were approximately 500,000 California workers' compensation claims in accident year 2011.⁴ To estimate the proportion of those claims that involved opioid prescriptions, the authors analyzed a sample of 417,508 claims with 2007-2009 dates of injury from the California Workers' Compensation Institute (CWCI) Industry Claims Information System⁵ (ICIS) database and identified 23.1 percent (96,400 claims) that included a payment record for at least one opioid prescription in the first 24 months following the date of injury. The authors then applied that percentage to the estimated 500,000 claims from AY 2011 to derive an estimated population of 115,447 claims from AY 2011 that involved opioid prescriptions.

The authors also categorized the opioid claims from the ICIS sample into four groupings based on the number of prescriptions that had been dispensed in the first two years. The resulting distribution showed that 41.1 percent of the claims involved a single opioid prescription; 24.7 percent had 2 to 3 prescriptions; 13.6% had 4 to 7 prescriptions; and 20.6 percent had more than 7 opioid prescriptions. Those percentages were then applied to the 115,447 opioid claims estimated for AY 2011 to produce the distribution shown in Exhibit 2.

Estimating System-wide Savings through 3rd Party Payer Access to CURES

Prior studies have documented the high proportion of California workers' compensation claims with opioid use that is not supported by the evidence-based medical literature and the workers' compensation medical treatment utilization schedule (MTUS). CWCI has estimated that almost half of all claims with Schedule II opioids fall outside the pain management medication recommendations included in the evidence-based medical literature.⁶ Many workers' compensation payers, as well as other stakeholders, believe that access to the CURES system, coupled with enhanced medical cost containment strategies including medical provider networks (MPN) monitoring and utilization review (UR) – could significantly reduce the average number of prescriptions and the average dose levels of workers' compensation claims that utilize opioids.

In Exhibit 3, the authors produced a conservative estimate of the potential savings available through access to CURES data. The model used the estimated number of opioid claims within each of the four opioid utilization categories (noted in Exhibit 2) and applied a cost-reduction savings factor against the average medical and indemnity benefit payments per claim.⁷

⁴ The estimated total number of claims was based on information compiled by the California Workers' Compensation Insurance Rating Bureau. This estimate accounts for insured and self-insured employers.

⁵ ICIS is a proprietary database maintained by the California Workers' Compensation Institute that contains detailed information, including employer and employee characteristics, medical service information, and benefit and other administrative cost information on more than 4 million workplace injuries with dates of injury between 1993 and 2011.

⁶ Swedlow, A., Ireland, J., Johnson, G. Prescribing Patterns of Schedule II Opioids in California Workers' Compensation. Research Update, CWCI. March 2011.

⁷ The authors adjusted the 2008 study's average cost per claim by prescription category to 2011 levels with a 28.2 percent medical inflation factor and a 20.6 percent indemnity inflation factor. (inflation factors derived from "2008 – 2011 average medical and indemnity payments from "Analysis of Medical and Indemnity Benefit Payments, Medical Treatment and Pharmaceutical Cost Trends in the California Workers' Compensation System", CWCI June 2012)

Exhibit 3. Potential Workers' Compensation Savings from Enhanced Opioid Management Controls Via CURES

Claims by Opioid Scripts	Claim Count	Average Paid Benefits from 2008 Study		Estimated Total Benefits Paid on 2011 Claims		Est. % Savings	Potential Savings		
		Med Ben	Indem Ben	Medical Benefits	Indemnity Benefits		Medical Benefits	Indemnity Benefits	Tot Benefits
1	47,434	\$3,908	\$4,351	\$185,398,901	\$206,391,638	-	-	-	-
2-3	28,508	5,321	5,781	\$151,700,753	\$164,807,267	3.0%	\$4,551,023	\$4,944,218	\$9,495,241
4-7	15,745	7,640	8,709	\$120,292,830	\$137,119,795	5.0%	\$6,014,641	\$6,855,990	\$12,870,631
>7	23,760	9,132	11,813	\$216,976,537	\$280,677,161	7.0%	\$15,188,358	\$19,647,401	\$34,835,759
Total	115,447	\$5,820	\$6,777	\$674,369,021	\$788,995,861		\$25,754,022	\$31,447,609	\$57,201,631
								Est. CURES Operating Budget:	\$3,700,000
								Workers' Comp Return-on-Investment	\$15.5 : \$1

The authors estimate that the enhanced opioid management controls offered by 3rd party payer access to CURES data would produce no cost savings for claims with only one opioid prescription, but estimate a 3 percent reduction in total benefits paid on claims with 2 to 3 opioid prescriptions; a 5 percent reduction in payments on claims with 4 to 7 opioid prescriptions; and a 7 percent reduction in payments on claims with more than 7 opioid prescriptions. Under this scenario, the total estimated cost savings on AY 2011 claims is \$57.2 million.

Return-on-Investment

The operating budget for the CURES system is estimated at \$3.7 million⁸. Should the California workers' compensation system cover the cost of the entire CURES system operating budget, the return-on-investment is estimated at \$15.5:\$1.

Actual savings and ROI will depend upon several factors, including access to CURES system data; medical and pharmaceutical cost trends; injury mix; medical cost containment/utilization review intervention; and applicable workers' compensation statutes, rules and regulations.

About CWCI

The California Workers' Compensation Institute, incorporated in 1964, is a private, non-profit organization of insurers and self-insured employers conducting and communicating research and analyses to improve the California workers' compensation system.

⁸ CURES 2.0: An Integrated Approach to Preventing Prescription Drug Abuse and Diversion. California Department of Justice. December 2012

Resources



**If You See Signs or Symptoms of
Overdose Call 911 and/or Contact:**

Rocky Mountain Poison Center
1 (800) 222-1222

800.222.1222



**If You See Signs or Symptoms of
Dependency or Addiction Contact:**

The doctor who prescribes
your opioid medication

**Department of Health & Human Services
Chemical Dependency Bureau**
(406) 444-3964

or call the toll-free number

or directly to

Montana Department of Health & Human Services

Montana Department of Health & Human Services

Assistance with Return to Work:

Stay at Work/Return to Work Program
(406) 444-1752

Email: sawrtwrquest@mt.gov

Montana Department of Labor and Industry
(406) 444-6543
Email: dliquestions@mt.gov
P.O. Box 1728
Helena, MT 59624-1728



Your Health Matters
Learn About Opioid Dependency



Montana Department of
LABOR & INDUSTRY
Employment Relations Division

**"Every 19 minutes someone dies
of prescription drug overdose
in America"**

-CNN "Deadly Dose" Documentary

**"More Americans die of prescription
drug overdose than on the highways
each year"**

US Centers of Disease Control

Opioid Dependency - Is Not Addiction

Opioids may naturally cause physical
dependency (tolerance & withdrawal)

Tolerance

Higher and higher doses of opioids are
required over time in order to achieve the
same effect.

Withdrawal

Negative physical and mental side effects
occur after extended use of a drug is reduced
abruptly or stopped.

5,000 copies of this public document were published at an
estimated cost of \$0.0772 per copy, for a total cost of \$386.00, which
includes \$386.00 for printing and \$0.00 for distribution.

Symptoms of Withdrawal

Physical Symptoms:

Tremors, abdominal pain, chills, perspiration, nausea, vomiting, diarrhea, flu-like symptoms, restless legs and rapid heartbeat.

Mental Symptoms:

Cravings for opioids, malaise, anxiety/panic attacks, paranoid thinking, dizziness, difficulty sleeping, and depression.

Serious Symptoms:

Cardiac arrhythmias, strokes, seizures, dehydration and suicide attempts.

Am I Dependent?

- ☐ Do you feel a strong need to take your opioid medication?
- ☐ Do you have difficulty controlling your use of opioid medication?
- ☐ Do you experience tremors, anxiety or other withdrawal symptoms when reducing your medication?
- ☐ Do you have to take more medication to ease the pain?
- ☐ Do you neglect food, hygiene or health care?
- ☐ Do you want to continue using your medication despite clear evidence of problems it is causing you?

Score: ____ / 6

* If you answered "yes" to three or more of these statements, you may have opioid dependence and be at risk for addiction.

Why It Matters?

"More Montanans die from prescription drug overdose than traffic crashes"

-MT DOJ, Forensic Science Division, 2011

Opioid dependency puts you at risk for:

- Death
- Mental Confusion
- Nausea
- Difficulty Breathing
- Constipation
- Drowsiness
- Sedation
- Itching
- Fatigue

Remember...

- Never take an opioid pain reliever unless it is prescribed for you
- Always take opioids as directed
- Do not use opioids with alcohol or other drugs or medicines
- Protect and lock up your opioids in a safe place, and properly dispose of leftover medicine
- Never share opioids with another person
- Be prepared for opioid emergencies
- Contact your doctor with any questions

Be on the Alert for...

Opioid Overmedication or Overdose

- Intoxicated behavior – confusion, slurred speech, stumbling
- Feeling dizzy, faint or drowsy
- Shortness of breath, slow or light breathing, or stopped breathing
- Unusual snoring, gasping, or snorting during sleep
- Difficulty waking up from sleep and becoming alert or staying awake
- Slow, unusual or stopped heartbeat



CAUTION:

A person who at first only seems to be overmedicated may get much worse. They should be kept awake and watched closely. Call 911.